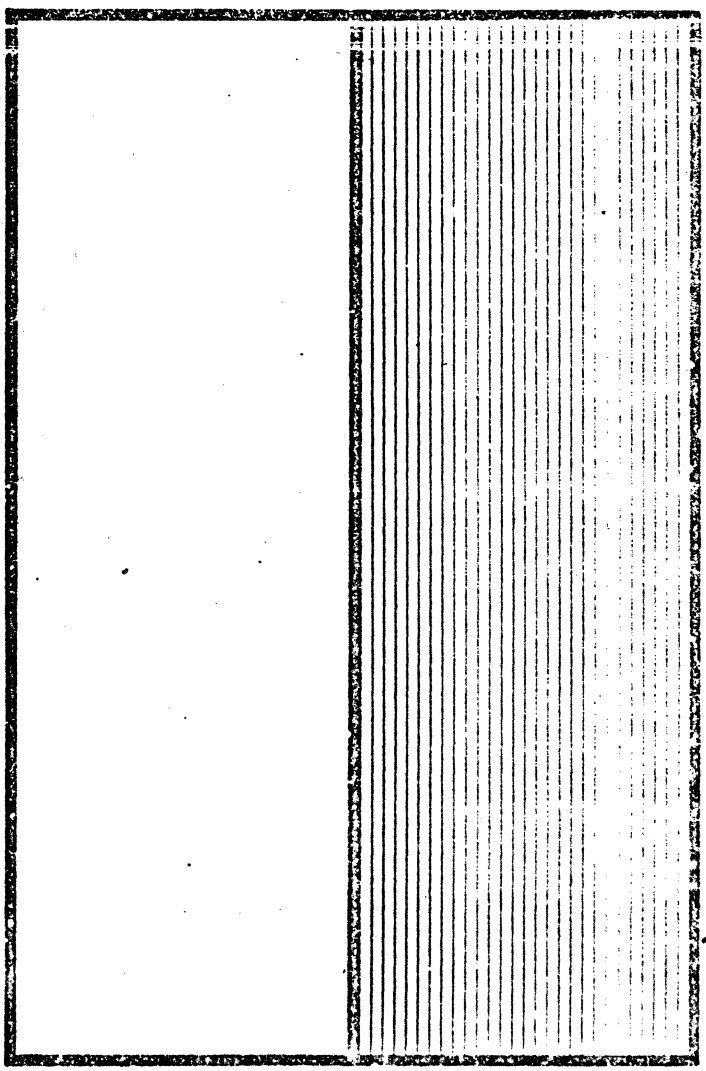
SPERRY RAND

UNIVAC 9400 SYSTEM

PROGRAM DESCRIPTION DRAWING



CUSTOMER ENGINEERING

4091699

SPERRY RAND UNIVAC

DRAWING NO. 4091699

REVISION A

CUSTOMER ENGINEERING
PRODUCT DIAGNOSTIC SOFTWARE

9400 5024/8414 FUNCTIONAL TEST - D4130
PROGRAM DESCRIPTION DRAWING

	SIGNATURE	TITLE	DATE
APPROVAL		Manager	
APPROVAL		Supervisor	
APPROVAL		Programmer	
APPROVAL		Programmer	

REVISION STATISTICS RECORD

DWG REV	MSTR REV	RELEASE DATE	DESIGNER NAME	EIR NUMBER	FCO NUMBER
A	M	11/1/72	PDS Phila., Pa.	C12606	

REVISION DESCRIPTION RECORD

REV	DESCRIPTION	UD #
A	Provide a cross reference between factory and Customer Engineering diagnostics. Provide the latest enhancements requested by Customer Engineering along with the latest factory testing techniques.	ϕϕϕ

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1. INTRODUCTION

1.1 Purpose. This document describes a 9400 Maintenance test program for the 5024/8414 Disc Subsystem.

1.2 Major Objectives. To test the data retentivity of a disc file under conditions of fringe erasing and residual magnetism.

1.3 Equipment Configurations. All equipment configurations must be connected to a Selector I-O Channel of the 9400 processor. This test will operate the following equipment configuration:

--Disc File Control - Type 5024
--Disc Drive - Type 8414
--Disc Pack Assembly - Type F1214

1.4 Associated Software. This program has DSKH included as an integral part of the program. This is the standard disc handler routine used by all Disc Maintenance test programs. It is the interface between the program and MCR, which performs program load, parameterization, execution, deletion, I-O handling, and message handling.

1.5 Reference Documents.

DRAWING	REVISION	DESCRIPTION
S70040	A	UNIVAC 9400 Processor, Type 3019-00 and -01.
--	-	UNIVAC 9400 Dual I-O Selector Channel, Type XXXX-00 and -01.
P10076	A	Disc File Control, Type 5024.
P21109	A	8414 Disc File.
4091622	-	Maintenance Control Routines.
4091623	-	Parameter and Message Routines.
3844459	-	5024/8414 Disc Program Handler.

2. FUNCTIONAL DESCRIPTION

2.1 General Organization. Tests 2 and 3 test to see if the count, key, and data of a selected record are affected by writing records on the adjacent tracks. After the adjacent records are written X number of times, the CKD of the original track is read and compared to that expected. In test 4 a number of records are written on a track, followed by writing data records X number of times on the odd numbered records. The count and keys of the even records are then read and compared to that expected.

2.2 Program Description

2.2.1 Test 1 (Group Test)

Objective - The objective of test 1 is to enable several tests to be internally selected simply by entering subtest 1. Test 1 selects tests 2 thru 4.

Method - The program places bits into the parameter location which tells DSKH which tests to enter.

2.2.2. Test 2 (Erase Head Fringing Test)

Objective - To verify that writing records on adjacent tracks does not affect the information on a given track.

Method - A Track Descriptor Record (7200 bytes) is written on a specified track (N). Track Descriptor Records having a complement data pattern to the first record are then written alternately on N+1 and N-1 tracks an optional number of times. Record zero of N is then read and compared to that expected.

2.2.3 Test 3 (Erase Head Fringing Test)

Objective - To verify that displacing the head several tracks before returning and writing on the adjacent tracks does not alter information on a given track.

Method - A Track Descriptor record (7200 bytes) is written on a specified track (N). The head is then moved to N-M, where (M) is a displacement greater than 1, then to N-1 where RO is written. This movement to N-M and writing on N-1 continues an optional number of times, then (N) is read and compared to that expected. The same occurs for the combinations N+M, N-M; N-M, N+1; and N+M, N+1.

2.2.4 Test 4 (Residual Magnetism Test)

Objective - To verify that writing data on a record does not alter the count and key of the following record.

Method - Count-key-data is written on every record of a specified track. Data is then written on the odd numbered records an optional number of times. The Count-key of the even records is then read and compared to that expected.

3. - OPERATING PROCEDURES

The Disc Handler Routine DSKII is used as a standard interface between the program and MCR. All operating procedures described in the DSKII documentation hold equally well for this program. See PDD 3044459.

3.1 Initialization. See DSKII documentation. The program is called by typing in D4130.

3.2 Test Program Parameters.

V6/DDDD/DDDD PRESET TO /55AA/AA55

First two bytes contain data pattern that will be written on primary track. Second two bytes contain complement data pattern for the adjacent tracks.

V17/RRMMØLLL PRESET TO /Ø11Ø115

RR	Repetitive Write is the number of writes that will occur on the adjacent tracks (Test 2 and 3) and on the odd records (Test
MM	Displacement used in Test 3.
ØLLL	Length of records that will be written in Test 4. Limits (ØØD7 - Ø671)

3.3 Test Program Messages. The DSKH documentation describes all test entry and exit messages and a standard I-O error message. Data errors are detected by the program, and all data error messages are contained in the program.

3.3.1 Test 1 - A simple parameter setting is performed here, so no errors can occur.

3.3.2 Test 2 - If an invalid cylinder or head is selected as V15 or V16, a message "RESELECT CYLINDER" is printed. Also the data read and expected is printed on all errors, as well as the byte position of the error.

```
--Reselect CYL. NO. V15-V16 = OOCCOOHHOOCCOOHH
--DATA COMPARE ERROR CYL. OOCCOOHH POSITION OXXX
  DATA READ XX
  DATA XPCT XX
```

3.3.3 Test 3

```
--DATA COMPARE ERROR   CYL OOCCOOHH POSITION OCCC
  DATA READ XX
  DATA XPCT XX              TEST N ± 1, N ± M
--RESELECT V15-V16 OOCCOOHHOOCCOOHH  AND OR
                   V17   XXXX0000
```

N ± 1 = Direction of adjacent track
N ± M = Direction of displacement

3.3.4 Test 4

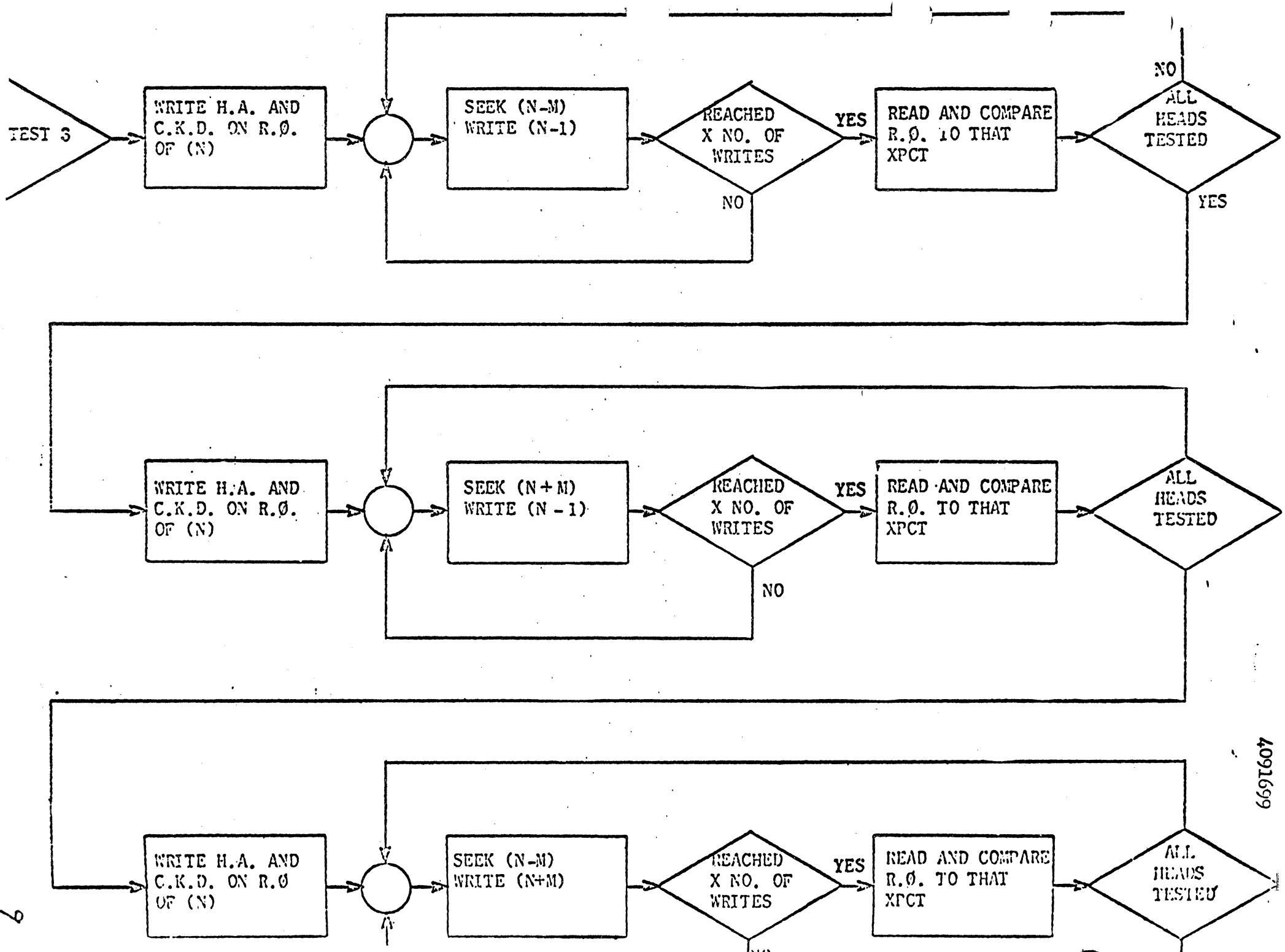
```
--RESELECT CYL NO  V15-V16 = OOCCOOHHOOCCOOHH
--COUNT KEY READ   OOCCOOHHRNKLOODLOOKN
  COUNT KEY XPCT   OOCCOOHHRNKLOODKOOKN
--RESELECT  V17+2  OOOOOXXX
```

CC = CYL NO
HH = Head No.
RN = KN = Record & Key N
KL = Key Length
DL = Data Length

4. SUPPLEMENTARY DATA

4.1 Supplementary Software Information. Each test f the program is entered separately by DSKII and stands alone. It could be extracted from the rest of the program and either be eliminated or assembled by itself with DSKII.

4.2 Supplementary Hardware Information. See DSKII documentation.


TEST 3
WRITE H.A. AND C.K.D. ON R.Ø. OF (N)
SEEK (N-M) WRITE (N-1)
REACHED X NO. OF WRITES
YES
NO
READ AND COMPARE R.Ø. TO THAT XPCT
ALL HEADS TESTED
NO
YES
WRITE H.A. AND C.K.D. ON R.Ø. OF (N)
SEEK (N+M) WRITE (N-1)
REACHED X NO. OF WRITES
YES
NO
READ AND COMPARE R.Ø. TO THAT XPCT
ALL HEADS TESTED
WRITE H.A. AND C.K.D. ON R.Ø OF (N)
SEEK (N-M) WRITE (N+M)
REACHED X NO. OF WRITES
YES
READ AND COMPARE R.Ø. TO THAT XPCT
ALL HEADS TESTED

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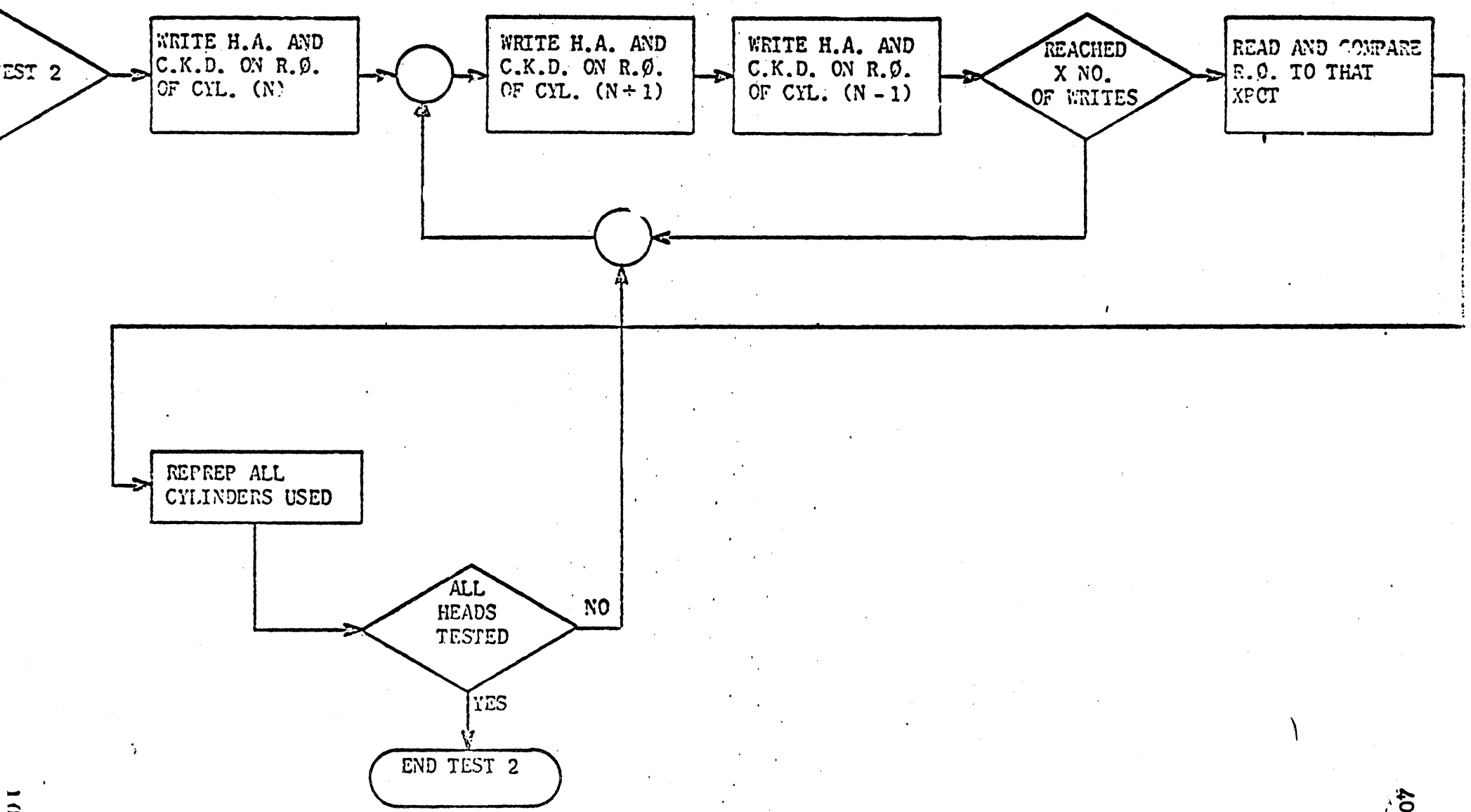
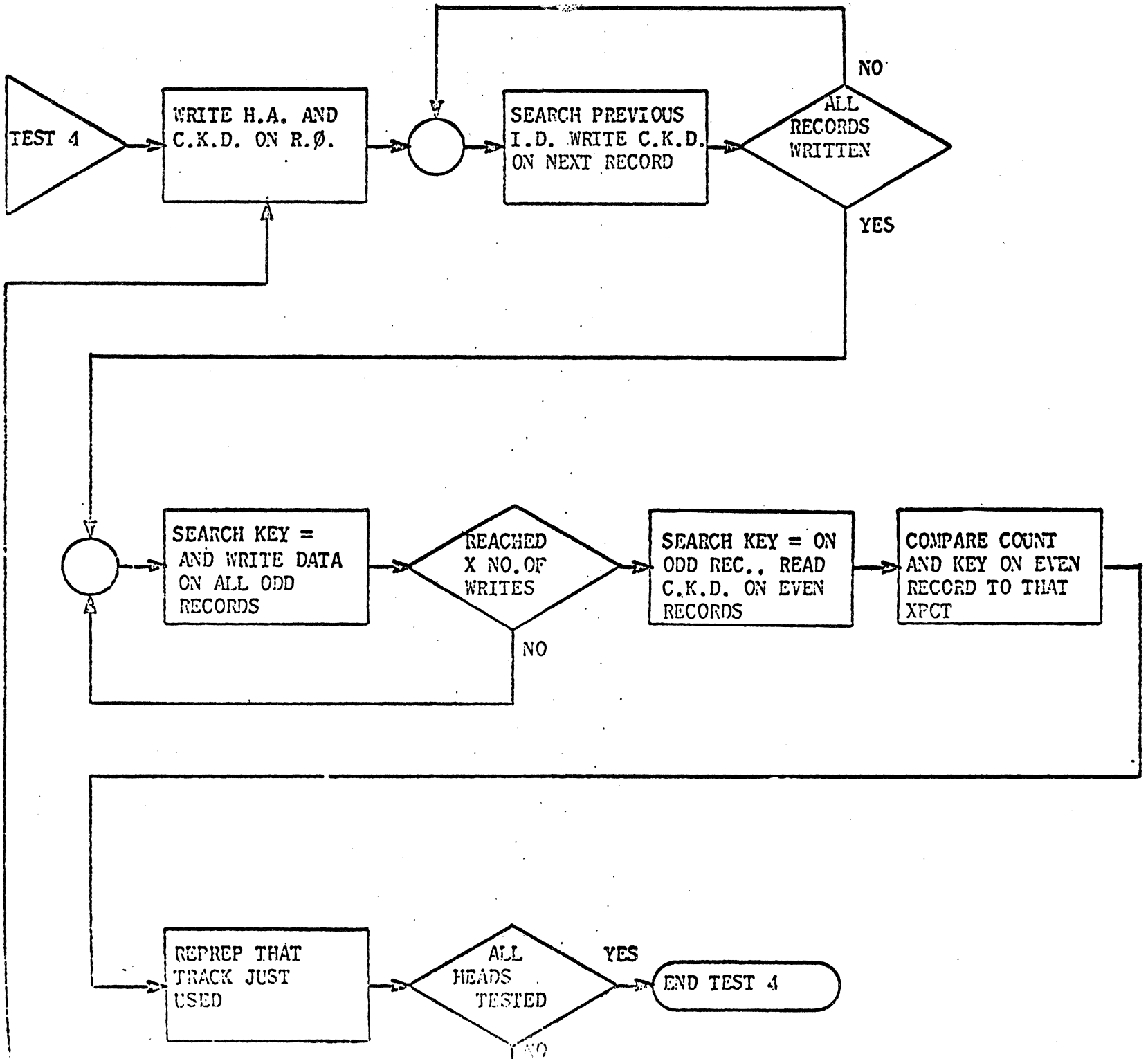

EST 2
WRITE H.A. AND C.K.D. ON R.Ø. OF CYL. (N)
WRITE H.A. AND C.K.D. ON R.Ø. OF CYL. (N+1)
WRITE H.A. AND C.K.D. ON R.Ø. OF CYL. (N-1)
REACHED X NO. OF WRITES
READ AND COMPARE R.Ø. TO THAT XPCT
REPREP ALL CYLINDERS USED
ALL HEADS TESTED
NO
YES
END TEST 2

A
WRITE H.A.
AND C.K.D. ON
R.Ø. OF (N)
SEEK (N+M)
WRITE (N+1)
REACHED
X NO. OF
WRITES
READ AND
COMPARE R.Ø.
TO THAT XFCT
REPREP ALL
CYLINDERS USED
NO
ALL
HEADS
TESTED
YES
END TEST 3


TEST 4
WRITE H.A. AND C.K.D. ON R.Ø.
SEARCH PREVIOUS I.D. WRITE C.K.D. ON NEXT RECORD
ALL RECORDS WRITTEN
NO
YES
SEARCH KEY = AND WRITE DATA ON ALL ODD RECORDS
REACHED X NO. OF WRITES
NO
SEARCH KEY = ON ODD REC., READ C.K.D. ON EVEN RECORDS
COMPARE COUNT AND KEY ON EVEN RECORD TO THAT XPCT
REPREP THAT TRACK JUST USED
ALL HEADS TESTED
YES
END TEST 4
NO